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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,523	02/05/2002	Eng C. Cheah	9818-066-999	9901

20583 7590 08/08/2002
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EXAMINER

WILLIAMS, ALEXANDER O

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 08/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,523

Applicant(s)

CHEAH ET AL.

Examiner

Alexander O Williams

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 12-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Serial Number: 10/068523 Attorney's Docket #: 9818-066-999
Filing Date: 2/5/02;

Applicant: Cheah et al.

Examiner: Alexander Williams

Applicant's election of Group I (claims 1 to 11) in Paper # 7, filed 7/23/02, has been acknowledged.

This application contains claims 12 to 22 drawn to an invention non-elected with traverse in Paper No. 7.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 3 to 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Bivona et al. (U.S. Patent # 5,990,418).

For example, in claim 1, Bivona et al. (figures 1 to 10) specifically **figure 6** show a ball grid array package comprising: a substrate **100** having a first and second sides; an integrated circuit device **102** attached to said first side of said substrate; a metal cap **104** having a side wall portion and a top portion forming an internal cavity, wherein said metal cap is attached to said first side of said substrate along a peripheral portion of said first side so that said integrated circuit device is within said internal cavity; and an epoxy encapsulant material **106** filling a substantial portion of said internal cavity, and said epoxy encapsulant material being in contact with both said integrated circuit device and said top portion of said metal cap.

Claims 6, 7 and 9 to 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bivona et al. (U.S. Patent # 5,990,418) in view of by Mertol (U.S. Patent # 5,940,271).

For example, in claim 6, Bivona et al. (figures 1 to 10) specifically **figure 6** show a ball-grid array package comprising: a substrate **100** having first and second sides; a metal heat slug **104** attached to said first side of said substrate, said metal heat slug having a die attach pad portion (**foot of 104 portion**); an integrated circuit device **102**; a metal cap **104** having a side wall portion and a top portion forming an internal cavity, and an epoxy encapsulant material filling a substantial portion of said internal cavity, said epoxy encapsulant material being in contact with both said integrated circuit device and said top portion of said metal cap. Bivona et al. fail to explicitly show at least one wirebond pad window portion, and peripheral rim portions; an integrated circuit device

attached to said die attach pad portion of said metal bent slug, wherein said metal cap is attached to said metal heat slug along said peripheral rim portions so that said integrated circuit device is within said internal cavity

Mertol is cited for showing a stiffener with integrated heat sink attachment. Specifically, Mertol (figures 1 to 8) specifically **figure 3B** discloses at least one wirebond pad window portion, and peripheral rim portions; an integrated circuit device **5** attached to said die attach pad portion of said metal bent slug, wherein said metal cap is attached to said metal heat slug along said peripheral rim portions so that said integrated circuit device is within said internal cavity for the purpose of providing external connection to an device.

Therefore, it would have been obvious to one of ordinary skill in the art to use Mertol's wirebond pad combination to modify Bivona et al.'s flip chip connection for the purpose of providing external connection to an device.

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bivona et al. (U.S. Patent # 5,990,418) in view of Nakashima (U.S. Patent Application # 2002/0063326 A1).

Bivona et al. show the features of the claimed invention as detailed above, but fail to explicitly show the metal cap having at least one hole in its top portion.

Nakashima is cited for showing an electronic part unit and circuit board apparatus. Specifically, Nakashima (figures 3 to 7) specifically **figure 4** discloses a ball grid array comprising: an integrated circuit device **11** using a bondwire connection and metal cap **31a** having at least one hole in its top portion for the purpose of providing epoxy encapsulant material in a targeted area within the device.

Therefore, it would have been obvious to one of ordinary skill in the art to use Nakashima's cap holes to modify Bivona et al.'s flip chip connection for the purpose of providing epoxy encapsulant material in a targeted area within the device.

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bivona et al. (U.S. Patent # 5,990,418) in view of Mertol (U.S. Patent # 5,940,271) and further in view of Nakashima (U.S. Patent Application # 2002/0063326 A1).

The combination of Bivona et al. and Mertol show the features of the claimed invention as detailed above, but fail to explicitly show the metal cap having at least one hole in its top portion.

Nakashima is cited for showing an electronic part unit and circuit board apparatus. Specifically, Nakashima (figures 3 to 7) specifically **figure 4** discloses a ball grid array comprising: an integrated circuit device **11** using a bondwire connection and metal cap **31a** having at least one hole in its top portion for the purpose of providing epoxy encapsulant material in a targeted area within the device.

Therefore, it would have been obvious to one of ordinary skill in the art to use Nakashima's cap holes and Mertol's wirebond pad combination to modify Bivona et al.'s flip chip connection for the purpose of providing external connection to an device and providing epoxy encapsulant material in a targeted area within the device.

The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/704,710,712,713,675,784,786- 795,737,738,734,667,668,680,774,778,780	8/7/02
Other Documentation: foreign patents and literature in 257/704,710,712,713,675,784,786- 795,737,738,734,667,668,680,774,778,780	8/7/02
Electronic data base(s): U.S. Patents EAST	8/7/02

Papers related to this application may be submitted to Technology Center 2800 by facsimile transmission. Papers should be faxed to Technology Center 2800 via the Technology Center 2800 Fax center located in Crystal Plaza 4-5B15. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center 2800 Fax Center number is (703) 308-7722 or 24. Only Papers related to Technology Center 2800 APPLICATIONS SHOULD BE FAXED to the GROUP 2800 FAX CENTER.

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Any inquiry concerning this communication or any earlier communication from the examiner should be directed to ***Examiner Alexander Williams*** whose telephone number is **(703) 308-4863**.

Any inquiry of a general nature or relating to the status of this application should be directed to the ***Technology Center 2800 receptionist*** whose telephone number is **(703) 308-0956**.

8/7/02

A handwritten signature in black ink, appearing to read 'A. Williams', with a stylized flourish at the end.

Primary Examiner
Alexander O. Williams